INFRASTRUCTURE REVOLVING FUNDS: A FIRST REVIEW

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SUMMARY

This paper examines eight alternative financial configurations for a National Infrastructure Fund (NIF). While these cases can be helpful in comparing different financial structures, they are less suitable for predicting the outcome of particular options because they rely on 30-year projections of economic conditions, and take no account of loan defaults either by the state infrastructure funds or by individual projects.

A NIF would typically be financed with a federal loan or grant and, in turn, would make loans for particular infrastructure projects, presumably at below-market interest rates. Under most options, a pool of permanent capital could be created to be used for future infrastructure loans. As a result, the NIF represents a significant change from current infrastructure programs. An important similarity between existing government programs and any NIF proposal, however, is the economic cost both place on society. While a revolving fund does not reduce the cost of financing public investments, the share of these costs to be borne by federal and state and local governments can vary widely, as shown by the case studies we have examined. Three major conclusions can be drawn from these case studies:

- Charging interest on NIF funds lent for projects would increase the number of projects that could be built for any given level of federal expenditure.

- Charging interest on federal funds provided to the NIF would reduce federal costs significantly, but would also reduce the funds available for project investment. There would be very little change in the ratio of projects built per federal dollar.

- As federal costs are reduced, state and local costs would increase at any level of project investment.

CHAPTER I. INTRODUCTION

In recent years, concern about the condition of the nation's public works infrastructure has focused attention on ways to improve existing federal infrastructure programs. [1] A report prepared last year by the Joint Economic Committee (JEC) took a different approach and suggested a new financing mechanism for infrastructure, a National Infrastructure Fund (NIF). [2] As proposed by the JEC, the NIF would make loans to state and local governments for infrastructure projects with funds provided by new taxable bonds issued by the federal government. In July 1984, legislation (H.R. 5948, reintroduced as H.R. 1776 and as S. 849 in the 99th Congress) was introduced for a NIF based on the JEC model but capitalized through a multiyear federal authorization.

While many variations are possible, a typical NIF would differ from existing grant programs in three major ways:

- The initial federal capital would eventually be repaid;
- A pool of permanent loan funds would be generated within the NIF; and
- In selecting projects to invest in, state and local authorities would be able to make tradeoffs among different areas of infrastructure.

Other proposals for new, broad-based infrastructure programs were also made in the 98th Congress. One was a more traditional matching grant, targeted toward urban areas experiencing economic distress (H.R. 5765, reintroduced in the 99th Congress as H.R. 377). Another (H.R. 2419) proposed a NIF-like institution that would make loans for infrastructure projects using federal and state seed money to raise funds in the bond market. A recent, but as yet unintroduced, proposal would permit localities to use their federal transit grants to establish a sinking fund that would repay zero coupon transit bonds issued by local authorities.

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1. Congressional Budget Office, Public Works Infrastructure: Issues and Options for the 1980s (April 1983).

2. Joint Economic Committee, Hard Choices (February 1984).

These proposals represent significant departures from current federal programs, which generally make grants to individual areas of infrastructure. Debate over the possible implications for a National Infrastructure Fund has just begun, with one hearing held last year and others expected during this Congress.

This paper examines the financial effectiveness of the NIF approach using variations on recent proposals as examples within a consistent analytical framework. The analysis focuses on the projected flow of funds and, as such, it does not represent an exhaustive comparison of these different approaches--in particular, it does not consider differences in regional impacts, equity, economic feasibility, and the cost-effectiveness of the projects that are financed that might arise. Because of the limited scope of the analysis, it should not, by itself, be used to infer preference for any particular proposal. Rather, this analysis uses the current proposals and some variations they suggest to examine the effect of different financial structures on the volume of projects the NIF can finance, on the costs borne by federal and state or local organizations, and on the NIF's long-term financing capability.

HOW REVOLVING FUNDS WORK

A NIF is a special type of revolving fund. Funds are recycled by relending project loan payments to borrowers for new projects. At the project level therefore, all funds are loans that together with interest payments, if any, are repayable under terms determined by NIF policy. The success of the revolving fund depends on discipline in enforcing loan repayments; any defaults on project loans will reduce directly the potential volume of activity.

The revolving fund may be capitalized by equity (a special federal grant, for example) or by low-interest debt. In either case, the capital will be provided at below market rates. This subsidy creates the loan capital which the fund lends for projects. The fund's capital may also be increased by income from other sources, including interest earned on temporary cash balances or on project loans.

In most proposals, the NIF would also make subsidized loans for projects. Thus the NIF both relies on and provides subsidies. This raises serious concerns about the economic implications of diverting resources from unsubsidized to subsidized investments. The extent to which such subsidies lead to economic losses depends on several factors including: a) the degree to which NIF funds substitute for other, more expensive funds, b) the

extent to which allowing states and localities to select projects from a variety of programs now funded separately allows better tradeoffs among different priorities, c) the incentives NIF managers have for careful project screening and selection, and d) the size of the subsidy provided on project loans.

The principal variables that affect operation of a NIF are:

- The terms under which project loans are made, 3/
- The default rates for project loans,
- Whether the initial capitalization is provided by debt or equity,
- Terms for repaying the capital debt, and
- Sinking fund arrangements.

The cases examined in this paper are based on combinations of these variables of current interest to the Congress. This analysis assumes no project defaults, and thus represents the best outcome possible for each case.

Economic Assumptions

Economic assumptions underlying the comparisons are those of CBO's current baseline projections, held constant after 1989. In particular, calculations of federal and local debt service and sinking fund payments assume interest rates will remain constant for 30 years. This may overstate long-term rates. Using a more finely estimated rate projection would change interest rates and the discount rate commensurately so that comparisons between options should not be affected. Thus the results are useful to compare options, they are not designed to be precise predictions of the 30-year outcome of any particular case.

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3. The construction period for the projects (that is, the spendout rate) has little effect on financial results, however.

CHAPTER II. THE CASE STUDIES

The examples analyzed represent only a few of the possible variations for a NIF organization. While the case studies do not attempt to model particular pieces of legislation, they cover the main features of some of the recent proposals for new federal financing, along with variations in some key assumptions. Each case assumes initial capital funding of $10 billion, though not always provided over the same time period. Except for Case 7, the federal government provides all the initial capital. The eight cases presented here (see Tables A-1 through A-8 in the Appendix) are:

Case 1: The federal government provides capital to the NIF--and through it to state funds--of $1 billion a year for 10 years starting in 1986. Federal funds are repaid after 20 years without interest through a sinking fund established by the NIF in 1987. The state funds make project loans repayable over 20 years without interest.

Case 2: The same as Case 1, except that federal funds are repaid with 5 percent simple interest at term (rather than interest free).

Case 3: The same as Case 1, except that project loans are made for 10 years (rather than 20 years) with one year's grace in repayments.

Case 4: A matching grant proposal based on five annual appropriations of $2 billion without repayment, and a 50 percent state/local share of project cost. Since neither project finance nor capital is repaid, this case resembles the way in which current federal infrastructure programs work.

Case 5: A leveraged fund, where federal loan capital of $1 billion a year for 10 years (repaid after 20 years) is used to secure tax-exempt bonds issued by state funds. No interest is paid on federal capital loans, but project loans are repaid over 20 years with 5 percent interest. Bond capital is repaid from a sinking fund with bond interest paid, when due, from fund income. The volume of bonds issued is such that the ratio of fund income to debt service obligations in any year (debt-service coverage ratio) does not fall below 1.5:1.

Case 6: The same as Case 5, except that in addition to charging 5 percent interest on project loans, the federal loan capital is repaid after 20 years with 5 percent simple interest as a lump sum (rather than interest free). The sinking fund (rather than interest free) accumulates the interest repayment.

Case 7: A leveraged fund, capitalized by $10 billion in equal equity payments from federal and state sources. Funds for project loans are raised by issuing taxable bonds. The volume of bonds issued is again controlled by a requirement for a minimum 1.5:1 debt-service coverage ratio, subject to a further requirement that neither the value of outstanding bonds nor the value of outstanding project loans may exceed 10 times the paid-in capital of the NIF.

Case 8: A leveraged fund in which a federal sinking fund is established with half of $10 billion in funds that would otherwise be used for capital grants-in-aid (say, for mass transit), over a five-year period. The sinking fund repays 30-year tax-exempt, zero-coupon bonds issued by local authorities for capital projects. The other $5 billion is disbursed as traditional 80 percent matching grants for mass transit. The volume of bonds issued is leveraged above the sinking fund deposits by the spread between tax-exempt rates paid to bond holders and taxable rates paid by Treasury on the sinking fund account.

The leveraged fund examples (Cases 5 through 8) contain more uncertainty than the others since the implied volume of new bonds is substantial relative to the current level of activity in the municipal bond market. Tables A-5 and A-6 show the maximum leverage possible for the capital provided (about $2 billion a year in bonds for the $1 billion a year in federal funds), while maintaining a sound financial profile--defined here as a debt-service ratio of at least 1.5 in the most financially constrained year. Case 7 also shows a maximum bonding level subject to this limit. In this case, the debt-service ratio is more constraining than the two "ten times" limits assumed by Case 7.

NET PRESENT VALUE

Even after adjusting for inflation, a dollar paid tomorrow is worth less than a dollar paid today. This discount is usually calculated by reducing the future flow of funds by the expected rate of interest (roughly 10 percent at present) for each year in the future, and the resulting value is called the "net present value" (NPV). This represents the amount that would have to be set aside now (in a sinking fund, for example) to accumulate the future amount needed. For example, $1 billion paid 10 years from now has a present value of $390 million.

The concept of net present value is a consistent way of comparing costs and benefits that accrue in different years. For example, a project to be completed in 2015 is worth much less today than if that same project were to be completed in 1986. Similarly, a $1 billion expenditure today has a greater impact on the federal government's financial position now than a $1 billion expenditure in 10 years.

The NPV of the federal expenditures of each proposal is a consistent yardstick for comparing the impact of different streams of outlays, revenues, and tax expenditures on the level of the federal debt. [4/] For

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4. Tax expenditures have been estimated as the federal revenue loss at marginal tax rates for buyers of tax exempt securities and not at the average marginal rate (about 50 percent higher) for this group.

example, the net present value of federal outlays in Case 1 is $5.8 billion. In other words, a one-time outlay of $5.8 billion in 1986 will increase the federal debt in 2015 by the same amount as would the adoption of Case 1. Alternatively, this option in combination with $5.8 billion in one-time cuts in other programs would not increase the federal debt at the end of 30 years.

COMPARISON OF OPTIONS

The financial costs and benefits of each proposal are summarized in Table 1. This does not represent an analysis of the overall economic costs and benefits of each case study. For simplicity, the financial benefits of each case are estimated as the dollar value of projects financed, plus the net worth of the fund, without regard to the economic worth of these projects. However, because of the subsidies provided through the NIF, these projects are likely to have returns below projects undertaken from unsubsidized sources though not necessarily lower than all projects financed under existing grants.

As with most federal grant programs, the costs of the NIF are shared by the federal government and by state and local agencies that receive loans from the NIF. When no local capital match is required, state and local costs will be in the form of loan repayments. These represent real resources that state and local governments must give up in order to repay the loans they receive from the NIF. At the national level, the financial effectiveness of the first four cases is the same: each dollar of costs produces a dollar in assets, either as projects financed or as net worth for the NIF after 30 years. (For example, in Case 1, both financial costs and financial benefits equal $9.9 billion.) What differs is the total amount of costs and benefits produced and how these costs are divided between the federal and nonfederal governments.

While the federal share of costs differs, this is not markedly affected by whether federal loan capital is repaid with interest (compare Cases 1 and 2). The matching grant proposal (Case 4) requires a 50 percent state/local cost share, nearly 10 points above the share implied by 20-year project loans in Cases 1 and 2, and 10 points below the share if project loans are made for 10 years (Case 3). The federal share is highest (93 percent) in Case 8 where the federal sinking fund assumes all debt-service obligations on behalf of local authorities. Interest payments in Case 2 reduce both the volume of projects financed and the federal (and local) cost, leaving the ratio of costs to projects unchanged.

For a leveraged fund, however, both the federal cost and the overall financial cost-effectiveness of the NIF depend on the way leverage is applied. Cases 5 and 6 assume that state funds leverage federal capital with tax-exempt bonds. In these cases, costs will be higher than benefits, nationally, because sinking fund deposits must be increased to compensate for lower municipal interest rates at which they must be invested under

TABLE 1. COMPARISON OF FINANCIAL COSTS AND BENEFITS
(Net present values, in billions of dollars)

	Case 1 20-Year Project Loans	Case 2 20-Year Project Loans	Case 3 10-Year Project Loans	Case 4 50 Percent Matching Grants	Case 5 Leveraged Tax-Exempt Bonds	Case 6 With Bonds	Case 7 Leveraged With Taxable Bonds	Case 8 Zero Coupon Bond
Interest on federal loan	0	5	0	--	0	5	--	--
Interest on project loan	0	0	0	--	5	5	7	0
Costs								
Federal Outlays	5.8	4.7 a/	5.8	6.1	5.8	4.7 a/	5.0	11.6
Tax Expenditures								
Years 1-30	--	--	--	--	5.3	3.3	--	--
After year 30	--	--	--	--	0.5	0.3	--	--
Total Federal	5.8	4.7	5.8	6.1	11.6	8.3	5.0	11.6
State/Local Match	--	--	--	6.1	--	--	5.0	0.9
Project Repayments								
Years 1-30	3.8	3.2	8.2	--	14.8	10.0	22.3	--
After year 30	0.3	0.2	0.5	--	2.5	1.9	4.8	--
Total Costs	9.9	8.1	14.5	12.2 b/	28.9	20.2	37.1	12.5
Federal Costs as Percent of Total	59	58	40	50	40	41	13	93
Benefits								
Projects Financed	9.4	7.8	13.6	12.2	24.5	16.8	32.5	12.5
NIF Net Worth in Year 30	0.5	0.3	0.9	--	3.3	2.2	4.6	-- c/
Total Benefits	9.9	8.1	14.5	12.2 b/	27.8	19.0	37.1	12.5

SOURCE: Congressional Budget Office from Tables A-1 through A-8 in the Appendix.

NOTE: Details may not add to totals because of rounding.

a. Net of interest repayments.

b. Non-project set-asides total $152 million.

c. Net worth at end of year 35.

arbitrage rules, set by the Internal Revenue Service. Thus, the $1.1 billion gap shown for Case 5 ($28.9 billion minus $27.8 billion) represents the national loss from switching investment capital from higher-yielding federal or corporate issues to municipal rates. In Case 7 where a federal NIF issues taxable bonds for loan capital, and in Case 8 where the sinking fund is invested in taxable securities, this loss is avoided, and costs again are equal to benefits.

In Cases 5 through 7, project loan terms are subsidized below those of capital-raising bonds. Cases 5 and 6 assume 20-year loans at 5 percent. Case 7, with higher bond interest, charges 7 percent on 20-year project loans, still below projected rates for tax-exempt securities. Case 8 provides loans at zero interest.

The financial benefits from each proposal have been broken into two categories: the cost of projects built in the first 30 years of the NIF, and the net worth of the NIF in the 30th year. This net worth represents the resources available to the NIF after direct federal involvement has ended. It is a rough measure of the value of new projects the NIF will be able to finance after 30 years.

To make these comparisons, additions to the data in Tables A-1 through A-8 are needed to adjust for operations after the 30th year. In the first four examples and in Cases 7 and 8, the balance between costs and benefits holds for both the first 30 years and beyond. This means that if NIF operations continue at full scale, the one-to-one ratio between national costs and benefits would persist. In Cases 5 and 6, however, the loss is split between the two periods, so that if NIF operations continue after 30 years new costs would continue to be incurred that are greater than new benefits.

From a national point of view, the net worth of the NIF after 30 years is much less than the nominal balance sheet values shown in Tables A-1 through A-8.

Value of NIF in 30 Years (In billions of dollars)

	Permanent Capital	NPV Permanent Capital	NPV Net Worth
Case 1	9.5	0.6	0.5
Case 2	6.7	0.4	0.3
Case 3	11.5	0.7	0.9
Case 4	--	--	--
Case 5	31.3	2.0	3.3
Case 6	26.7	1.7	2.2
Case 7	46.2	2.9	4.6
Case 8	--a/	--a/	--a/

a. Values after 35 years since this option assumes a 35 year cycle.

This results because most of NIF's assets, except for the sinking fund used in Case 8, are worth less than their face value. An equivalent market value has been substituted for NIF's zero percent, 5 percent, and 7 percent loans, reflecting what NIF could sell the loans for in the open market, assuming borrowers are credit worthy. In this comparison, the leveraged funds (Cases 5 through 7) clearly rank higher than Cases 1 through 4. Partly, however, this reflects the assumption that project loans in the first four examples are interest free, so that the market value of outstanding loans in those cases is much less than that of the leveraged funds, which charge at least 5 percent interest. The long-term financial capabilities of Cases 1 through 4 would therefore be substantially improved by even modest increases in project lending terms. In Case 8 the sinking fund is exhausted in the 35th year and the fund is terminated.

CONCLUSIONS

Major issues to be considered in designing a NIF include:

- The effect of charging interest on project loans;
- The effect of charging interest on federal loans to the NIF;

Interest on Project Loans

The rate of interest paid on project loans has a major effect on the federal government's share in total costs and the ratio of federal cost to total projects financed (Table 2). Charging interest raises the income of the NIF, thus permitting more projects to be financed for the same level of federal capital provided. Comparing Case 1 with Cases 5 or 6 shows that the change from zero to 5 percent interest charged by the NIF on its project loans decreases the federal government's share of total cost from roughly 60 percent to 40 percent. Charging interest also increases the ratio of projects financed to federal cost from 1.6:1 to, under some circumstances, more than 6 to 1. (As discussed below, the cost of funds to the NIF does not affect these ratios.) Federal cost-effectiveness of the funds leveraged with tax-exempt bonds (Cases 5 and 6) is about the same as the matching grant proposal, and similar to Case 3 with shorter project repayments.

The ratio of projects financed to federal dollars could be improved by fairly mild increases in the terms of project loans--for example, a 5 percent interest repayment to the federal government could be financed by charging 3.5 percent interest on project loans and still support the same level of projects as with no interest. In other words, a 3.5 percent rate of interest for project loans would permit the reduced federal costs shown in Case 2 but would still finance the higher level of projects possible under Case 1.

TABLE 2. COMPARISON OF FEDERAL COSTS AND PROJECTS FINANCED

	Net Present Value (In billions of dollars)		Ratio of Projects to Federal Cash	Federal Costs as a Percent of Total
	Federal Outlay and Tax Expenditure	Volume of Projects Financed		
Case 1	5.8	9.4	1.62:1	59
Case 2	4.7a/	7.8	1.66:1	58
Case 3	5.8	13.6	2.34:1	40
Case 4	6.1	12.2	2.00:1	50
Case 5	11.6	24.5	2.11:1	40
Case 6	8.3a/	16.8	2.02:1	41
Case 7	5.0	32.5	6.50:1	13
Case 8	11.6	12.5	1.08:1	93

SOURCE: Congressional Budget Office.

a. Includes federal interest repayment.

Interest on Federal Loans

The rate of interest the NIF pays to the federal government does not have a significant effect on the ratio of projects financed to federal costs, nor does it affect the federal government's share in total cost. Comparing Case 1 with Case 2 shows that the change from zero to 5 percent interest paid by the NIF to the federal government merely reduces both the level of projects financed and the federal cost without affecting the federal government's share in total cost or the ratio of projects financed to total federal cost.

This surprising result occurs because the NIF is an intermediary between the federal government and the actual project loans. Because the NIF makes payments to a sinking fund almost as soon as it receives the federal capital, the federal government, in a sense, is paying the interest to itself.

Other Concerns

The Congressional Budget Office (CBO) has no way to forecast the extent to which states or localities might choose to leverage federal funds with tax-exempt issues and, for comparative purposes, has calculated maximums meeting certain conditions. Cases 5 and 6 show the maximum leverage assuming that project loans are made for 20 years at 5 percent interest. Alternatively, a leveraged fund could be designed to maximize the interest-rate subsidy provided to projects.

If project loans were made at zero interest, the federal capital could support a volume of bonding of a little more than $1 billion a year versus the $1.9 billion shown in Table A-5. Hence, a leveraged fund could generate annual activity of between one and two times the annual federal allocation. As shown in Tables A-5 and A-6, this leveraging could continue beyond the end of federal support if fund income is sufficient. Further, if states choose to add tax revenues to the funding capital, leverage could be increased substantially with major reductions in the federal cost share. Also, use of a less conservative (lower) debt-service ratio than the 1.5 used here would permit the issuance of more bonds, though with increased risks.

The examples also differ in their long-term financing capability once federal aid has been repaid. In the first four cases where the only debts of the NIF (those to the federal government) are repaid after 30 years, the long-term financial capability of the fund is measured directly by the permanent capital, or the net assets built up in the fund over the 30 years.

The leveraged funds except Case 8, however, would continue to issue debt and hence to incur obligations for sinking fund and interest expenses, while continuing to make project loans and earn interest on projects and cash balances. In the cases tested, annual additions to assets (new project loans) exceed annual additions to debt (new bond issues), and annual income is at least 1.5 times debt service in the thirtieth year and thereafter. In these cases, permanent capital is a conservative measure of the long-term financing capability of the fund. This might not be true if a less stringent--that is, lower--debt-service coverage test were applied. The zero coupon option does not generate permanent capital after local bonds have been repaid. CBO has not made an exhaustive search for other conditions under which the fund's capital could be eroded when federal support is withdrawn.

Lastly, a major concern is the extent to which a new source of subsidized financing will generate projects of economic value. One can expect that the NIFs which charge interest or project loans will discourage borrowers with very low return projects, and NIFs which repay capital with interest will have better incentives to choose borrowers carefully.

APPENDIX TABLES

TABLE A-1. INFRASTRUCTURE FUND MODEL, 3-YEAR SPENDOUT, NO INTEREST (In millions of dollars)

YEAR	TOTAL FEDERAL CAPITAL (1)	FEDERAL TAX EXPEND	INTEREST EXPENSE	FEDERAL CASH FLOW	STATE LOCAL CASH FLOW (2)	NIF PROJECTS FINANCED (3)	NIF PROJECT R'PMTS (4)	NIF S. FUND P'MTS (5)	NIF CASH BALANCE	NIF PERM. CAPITAL
1986	1,000	0	109	1,109	0	156	2	0	924	78
1987	1,000	0	225	1,225	0	634	16	18	1,410	203
1988	1,000	0	352	1,352	0	1,085	53	37	1,476	343
1989	1,000	0	491	1,491	0	1,136	108	55	1,531	494
1990	1,000	0	645	1,645	0	1,180	165	74	1,587	657
1991	1,000	0	813	1,813	0	1,223	225	92	1,645	836
1992	1,000	0	998	1,998	0	1,268	287	110	1,707	1,033
1993	1,000	0	1,202	2,202	0	1,315	350	129	1,771	1,252
1994	1,000	0	1,426	2,426	0	1,365	417	147	1,839	1,497
1995	1,000	0	1,672	2,672	0	1,418	486	166	1,911	1,771
1996	0	0	1,838	1,838	0	1,317	555	184	1,066	2,004
1997	0	0	2,020	2,020	0	898	616	184	660	2,228
1998	0	0	2,220	2,220	0	509	656	184	675	2,478
1999	0	0	2,441	2,441	0	522	682	184	706	2,768
2000	0	0	2,679	2,679	0	545	708	184	743	3,101
2001	0	0	2,946	2,946	0	573	736	184	782	3,481
2002	0	0	3,238	3,238	0	604	765	184	823	3,914
2003	0	0	3,560	3,560	0	635	795	184	867	4,403
2004	0	0	3,914	3,914	0	669	828	184	912	4,955
2005	0	0	4,303	4,303	0	704	861	184	960	5,575
2006	(1,000)	0	4,626	3,626	0	744	895	166	1,026	6,172
2007	(1,000)	0	4,981	3,981	0	791	919	147	1,092	6,741
2008	(1,000)	0	5,371	4,371	0	839	922	129	1,134	7,277
2009	(1,000)	0	5,800	4,800	0	871	909	110	1,153	7,772
2010	(1,000)	0	6,272	5,272	0	886	896	92	1,162	8,219
2011	(1,000)	0	6,791	5,791	0	893	881	74	1,168	8,611
2012	(1,000)	0	7,361	6,361	0	898	864	55	1,171	8,941
2013	(1,000)	0	7,988	6,988	0	900	845	37	1,172	9,201
2014	(1,000)	0	8,677	7,677	0	900	823	18	1,169	9,382
2015	(1,000)	0	9,434	8,434	0	898	799	0	1,162	9,474
TOTALS:	0	0	104,394	104,394	0	26,375	18,064	3,495	---	---
NPV :	5,754	0	---	---	0	9,439	3,837	1,040	---	---

SOURCE: Congressional Budget Office.

ASSUMPTIONS: (1) Federal capital of $1 billion a year for ten years is repaid after 20 years without interest;
(2) No state or local matching funds are provided to NIF;
(3) Project spendout is over three years at the rate of typical municipal projects (15,45,40);
(4) Project loans are for 20 years without interest;
(5) The annuity sinking fund payments from 1987 are invested in Treasury securities;

NOTE: The table shows the flows of government costs and NIF project financing activity over the 30 years during which federal capital is provided and repaid. The net present value (NPV) line shows these flows in equivalent 1986 amounts (using a 10 percent discount rate) so that future costs and activity levels can be considered in decisions made today. The total federal cash flow is the sum of direct capital outlays and indirect costs including any tax expenditures for municipal matching bonds, and interest on debt issued to finance both outlays and tax expenditures, assuming federal budget deficits continue. Over the 30 years, interest paid to the sinking fund totals $6.5 billion.

TABLE A-2. INFRASTRUCTURE FUND MODEL, 3-YEAR SPENDOUT, 5 PERCENT INTEREST (In millions of dollars)

YEAR	TOTAL FEDERAL CAPITAL (1)	FEDERAL TAX EXPEND	INTEREST EXPENSE	FEDERAL CASH FLOW	STATE LOCAL CASH FLOW (2)	NIF PROJECTS FINANCED (3)	NIF PROJECT R'PMTS (4)	NIF S. FUND P'MTS (5)	NIF CASH BALANCE	NIF PERM. CAPITAL
1986	1,000	0	109	1,109	0	156	2	0	924	78
1987	1,000	0	225	1,225	0	628	16	55	1,376	204
1988	1,000	0	352	1,352	0	1,059	52	92	1,408	349
1989	1,000	0	491	1,491	0	1,083	106	129	1,434	510
1990	1,000	0	645	1,645	0	1,104	160	166	1,459	692
1991	1,000	0	813	1,813	0	1,123	215	202	1,486	900
1992	1,000	0	998	1,998	0	1,144	272	239	1,514	1,141
1993	1,000	0	1,202	2,202	0	1,165	329	276	1,543	1,420
1994	1,000	0	1,426	2,426	0	1,188	388	313	1,574	1,746
1995	1,000	0	1,672	2,672	0	1,211	448	350	1,606	2,126
1996	0	0	1,838	1,838	0	1,083	507	368	737	2,494
1997	0	0	2,020	2,020	0	644	555	368	313	2,883
1998	0	0	2,220	2,220	0	242	582	368	310	3,334
1999	0	0	2,441	2,441	0	240	595	368	322	3,863
2000	0	0	2,679	2,679	0	248	607	368	338	4,478
2001	0	0	2,946	2,946	0	261	619	368	356	5,186
2002	0	0	3,238	3,238	0	275	632	368	375	5,998
2003	0	0	3,560	3,560	0	289	646	368	395	6,923
2004	0	0	3,914	3,914	0	305	661	368	416	7,973
2005	0	0	4,303	4,303	0	321	676	368	437	9,158
2006	(2,000)	0	4,577	2,577	0	343	691	331	492	9,296
2007	(2,000)	0	4,828	2,828	0	381	695	294	554	9,381
2008	(2,000)	0	5,104	3,104	0	426	678	258	594	9,402
2009	(2,000)	0	5,407	3,407	0	456	646	221	612	9,346
2010	(2,000)	0	5,741	3,741	0	470	615	184	621	9,202
2011	(2,000)	0	6,107	4,107	0	477	583	147	628	8,958
2012	(2,000)	0	6,510	4,510	0	483	550	110	635	8,599
2013	(2,000)	0	6,953	4,953	0	488	517	74	641	8,111
2014	(2,000)	0	7,440	5,440	0	493	483	37	645	7,477
2015	(2,000)	0	7,975	5,975	0	496	448	0	648	6,681
TOTALS:	(10,000)	0	97,735	87,735	0	18,282	13,973	7,156	---	---
NPV :	4,750	0	---	---	0	7,762	3,241	2,186	---	---

SOURCE: Congressional Budget Office.

ASSUMPTIONS: (1) Federal capital of $1 billion a year for ten years is repaid after 20 years with 5 percent interest;
(2) No state or local matching funds are provided to NIF;
(3) Project spendout is over three years at the rate of typical municipal projects (15,45,40);
(4) Project loans are for 20 years without interest;
(5) The annuity sinking fund payments from 1987 are invested in Treasury securities;

NOTE: The table shows the flows of government costs and NIF project financing activity over the 30 years during which federal capital is provided and repaid. The net present value (NPV) line shows these flows in equivalent 1986 amounts (using a 10 percent discount rate) so that future costs and activity levels can be considered in decisions made today. The total federal cash flow is the sum of direct capital outlays and indirect costs including any tax expenditures for municipal matching bonds, and interest on debt issued to finance both outlays and tax expenditures, assuming federal budget deficits continue. Over the 30 years, interest paid to the sinking fund totals $14.6 billion.

TABLE A-3. INFRASTRUCTURE FUND MODEL, 3-YEAR SPENDOUT, 10 YEAR LOANS, NO INTEREST (In millions of Dollars)

YEAR	TOTAL FEDERAL CAPITAL (1)	FEDERAL TAX EXPEND	INTEREST EXPENSE	FEDERAL CASH FLOW	STATE LOCAL CASH FLOW (2)	NIF PROJECTS FINANCED (3)	NIF PROJECT R'PMTS (4)	NIF S. FUND P'MTS (5)	NIF CASH BALANCE	NIF PERM. CAPITAL
1986	1,000	0	109	1,109	0	157	4	0	925	78
1987	1,000	0	225	1,225	0	637	31	18	1,425	203
1988	1,000	0	352	1,352	0	1,101	107	37	1,531	347
1989	1,000	0	491	1,491	0	1,185	219	55	1,658	506
1990	1,000	0	645	1,645	0	1,283	340	74	1,800	684
1991	1,000	0	813	1,813	0	1,393	471	92	1,957	885
1992	1,000	0	998	1,998	0	1,514	613	110	2,129	1,113
1993	1,000	0	1,202	2,202	0	1,648	768	129	2,319	1,373
1994	1,000	0	1,426	2,426	0	1,795	936	147	2,528	1,668
1995	1,000	0	1,672	2,672	0	1,956	1,120	166	2,757	2,005
1996	0	0	1,838	1,838	0	1,978	1,312	184	2,085	2,315
1997	0	0	2,020	2,020	0	1,688	1,475	184	1,838	2,628
1998	0	0	2,220	2,220	0	1,414	1,562	184	1,953	2,977
1999	0	0	2,441	2,441	0	1,501	1,593	184	2,019	3,369
2000	0	0	2,679	2,679	0	1,554	1,624	184	2,067	3,806
2001	0	0	2,946	2,946	0	1,590	1,649	184	2,107	4,291
2002	0	0	3,238	3,238	0	1,620	1,667	184	2,137	4,827
2003	0	0	3,560	3,560	0	1,642	1,674	184	2,155	5,419
2004	0	0	3,914	3,914	0	1,655	1,671	184	2,157	6,069
2005	0	0	4,303	4,303	0	1,653	1,653	184	2,139	6,784
2006	(1,000)	0	4,626	3,626	0	1,643	1,621	166	2,119	7,469
2007	(1,000)	0	4,981	3,981	0	1,628	1,595	147	2,105	8,120
2008	(1,000)	0	5,371	4,371	0	1,621	1,595	129	2,117	8,734
2009	(1,000)	0	5,800	4,800	0	1,631	1,614	110	2,159	9,307
2010	(1,000)	0	6,272	5,272	0	1,661	1,627	92	2,205	9,836
2011	(1,000)	0	6,791	5,791	0	1,697	1,637	74	2,248	10,312
2012	(1,000)	0	7,361	6,361	0	1,730	1,648	55	2,291	10,729
2013	(1,000)	0	7,988	6,988	0	1,763	1,659	37	2,334	11,080
2014	(1,000)	0	8,677	7,677	0	1,796	1,672	18	2,378	11,354
2015	(1,000)	0	9,434	8,434	0	1,830	1,687	0	2,424	11,544
TOTALS:	0	0	104,394	104,394	0	45,966	36,846	3,495	---	---
NPV :	5,754	0	---	---	0	13,610	8,167	1,040	---	---

SOURCE: Congressional Budget Office.

ASSUMPTIONS: (1) Federal capital of $1 billion a year for 10 years is repaid after 20 years without interest;
(2) No state or local matching funds are provided to NIF;
(3) Project spendout is over three years at the rate of typical municipal projects (15,45,40);
(4) Project loans are for 10 years with one year of grace, without interest;
(5) The annuity sinking fund payments from 1987 are invested in Treasury securities;

NOTE: The table shows the flows of government costs and NIF project financing activity over the 30 years during which federal capital is provided and repaid. The net present value (NPV) line shows these flows in equivalent 1986 amounts (using a 10 percent discount rate) so that future costs and activity levels can be considered in decisions made today. The total federal cash flow is the sum of direct capital outlays and indirect costs including any tax expenditures for municipal matching bonds, and interest on debt issued to finance both outlays and tax expenditures, assuming federal budget deficits continue. Over the 30 years, interest paid to the sinking fund totals $6.5 billion.

TABLE A-4. INFRASTRUCTURE FUND MODEL MATCHING GRANTS SCHEME (In Millions of Dollars)

YEAR	APPRO-PRIATION (1)	SETASIDES #1 (2)	SETASIDES #2 (3)	PROJECT OUTLAYS (4)	INTEREST EXPENSE (5)	TOTAL PROJECTS (6)	PERCENT LEAKAGE FIVE (7)	PERCENT LEAKAGE TEN (7)	PERCENT LEAKAGE TWENTY (7)
1986	2,000	40	10	69	11	137	130	123	110
1987	2,000	40	10	637	77	1,274	1,210	1,147	1,019
1988	2,000	40	10	1,392	224	2,783	2,644	2,505	2,227
1989	2,000	40	10	1,715	405	3,430	3,259	3,087	2,744
1990	2,000	40	10	1,960	573	3,920	3,724	3,528	3,136
1991	0	0	0	1,891	673	3,783	3,594	3,405	3,026
1992	0	0	0	1,323	696	2,646	2,514	2,381	2,117
1993	0	0	0	568	625	1,137	1,080	1,023	909
1994	0	0	0	245	526	490	466	441	392
1995	0	0	0	0	448	0	0	0	0
1996	0	0	0	0	437	0	0	0	0
1997	0	0	0	0	455	0	0	0	0
1998	0	0	0	0	499	0	0	0	0
1999	0	0	0	0	548	0	0	0	0
2000	0	0	0	0	601	0	0	0	0
2001	0	0	0	0	659	0	0	0	0
2002	0	0	0	0	723	0	0	0	0
2003	0	0	0	0	794	0	0	0	0
2004	0	0	0	0	870	0	0	0	0
2005	0	0	0	0	955	0	0	0	0
2006	0	0	0	0	1,048	0	0	0	0
2007	0	0	0	0	1,149	0	0	0	0
2008	0	0	0	0	1,261	0	0	0	0
2009	0	0	0	0	1,383	0	0	0	0
2010	0	0	0	0	1,517	0	0	0	0
2011	0	0	0	0	1,664	0	0	0	0
2012	0	0	0	0	1,826	0	0	0	0
2013	0	0	0	0	2,003	0	0	0	0
2014	0	0	0	0	2,197	0	0	0	0
2015	0	0	0	0	2,410	0	0	0	0
TOTALS:	10,000	200	50	9,800	27,257	19,600	18,620	17,640	15,680
NPV :	7,582	152	38	6,138	---	12,277	11,663	11,049	9,821

SOURCE: Congressional Budget Office.

ASSUMPTIONS: (1) $2 billion is appropriated in each fiscal year from 1986 through 1990;
(2) Two percent of each appropriation is set aside--one percent for research and development; one percent for improving capital budgeting programs;
(3) One-half of one percent is set aside-- one-quarter percent for Puerto Rico; one-quarter percent for the territories;
(4) Amounts appropriated less the first set-aside are assumed to spend over five years at a rate typical of CDBG and UDAG funds (4,29,38,17,12);
(5) Interest cost for debt service on federal project share plus the first set-aside at the Treasury refinancing rate (9.7 percent);
(6) Total value of projects financed assuming a 50 percent local match;
(7) Total value of projects financed assuming that proportions of federal financing shown are used to supplement other federal programs; such uses of funds will not increase the overall volume of new projects financed.

TABLE A-5. INFRASTRUCTURE FUND MODEL, LEVERAGED FUND, NO INTEREST (In millions of dollars)

YEAR	TOTAL FEDERAL CAPITAL (1)	FEDERAL TAX EXPEND	INTEREST EXPENSE	FEDERAL CASH FLOW	BONDS OUT-STANDING (2)	NIF PROJECTS FINANCED (3)	NIF PROJECT R'PMTS (4)	NIF S.FUND P'MTS (5)	NIF CASH BALANCE	NIF PERM. CAPITAL
1986	1,000	58	103	1,160	1,900	284	5	0	2,732	115
1987	1,000	116	215	1,331	3,800	1,149	45	46	4,639	303
1988	1,000	174	339	1,513	5,700	1,955	153	92	5,790	553
1989	1,000	233	474	1,707	7,600	2,035	310	139	6,949	886
1990	1,000	291	623	1,914	9,500	2,120	474	186	8,119	1,310
1991	1,000	349	786	2,135	11,400	2,213	645	232	9,301	1,829
1992	1,000	407	965	2,372	13,300	2,315	823	279	10,493	2,450
1993	1,000	465	1,161	2,626	15,200	2,424	1,010	326	11,696	3,181
1994	1,000	523	1,376	2,899	17,100	2,543	1,205	372	12,912	4,029
1995	1,000	581	1,612	3,193	19,000	2,672	1,410	419	14,142	5,002
1996	0	640	1,775	2,415	20,900	2,803	1,626	466	14,292	6,007
1997	0	698	1,952	2,650	22,800	2,915	1,851	513	14,387	7,045
1998	0	756	2,147	2,903	24,700	2,992	2,085	559	14,468	8,122
1999	0	814	2,361	3,175	26,600	3,055	2,325	606	14,556	9,243
2000	0	872	2,596	3,468	28,500	3,123	2,570	655	14,655	10,416
2001	0	930	2,853	3,783	30,400	3,199	2,820	701	14,760	11,643
2002	0	988	3,136	4,124	32,300	3,281	3,076	748	14,872	12,928
2003	0	1,047	3,446	4,493	34,200	3,367	3,340	795	14,992	14,279
2004	0	1,105	3,785	4,890	36,100	3,460	3,610	842	15,123	15,701
2005	0	1,163	4,158	5,321	38,000	3,561	3,887	889	15,264	17,203
2006	(1,000)	1,163	4,464	4,628	38,000	3,689	4,168	889	14,477	18,691
2007	(1,000)	1,163	4,800	4,964	38,000	3,870	4,426	889	13,687	20,164
2008	(1,000)	1,163	5,169	5,332	38,000	4,068	4,631	889	12,821	21,619
2009	(1,000)	1,163	5,574	5,737	38,000	4,207	4,800	889	11,896	23,056
2010	(1,000)	1,163	6,017	6,180	38,000	4,307	4,974	889	10,954	24,474
2011	(1,000)	1,163	6,504	6,667	38,000	4,389	5,148	889	10,012	25,873
2012	(1,000)	1,163	7,038	7,201	38,000	4,472	5,321	889	9,068	27,251
2013	(1,000)	1,163	7,624	7,787	38,000	4,553	5,492	889	8,122	28,608
2014	(1,000)	1,163	8,266	8,429	38,000	4,633	5,661	889	7,174	29,942
2015	(1,000)	1,163	8,971	9,134	38,000	4,711	5,826	889	6,221	31,254
TOTALS:	0	33,790	100,293	124,133	---	94,365	83,717	17,751	---	---
NPV :	5,754	5,256	---	---	---	24,503	14,781	3,732	---	---

SOURCE: Congressional Budget Office.

ASSUMPTIONS: (1) Federal capital of $1 billion a year for 10 years is repaid after 20 years without interest;
(2) State or local bonds are issued until the debt service coverage ratio reaches 1.5;
(3) Project spendout is over three years at the rate of typical municipal projects (15,45,40);
(4) Project loans are for 20 years at 5 percent interest;
(5) The annuity sinking fund payments from 1987 are invested in municipal securities;

NOTE: The table shows the flows of government costs and NIF project financing activity over the 30 years during which federal capital is provided and repaid. The net present value (NPV) line shows these flows as the equivalent of 1986 amounts so that future costs and activity levels can be considered in decisions made today. The total federal cash flow is the sum of direct capital outlays and indirect costs including any tax expenditures for municipal matching bonds, and interest on debt issued to finance both outlays and tax expenditures, assuming federal budget deficits continue. Over the 30 years, interest paid to the sinking fund totals $16.3 billion.

TABLE A-6. INFRASTRUCTURE FUND MODEL, LEVERAGED FUND, 5 PERCENT INTEREST (In millions of dollars)

YEAR	TOTAL FEDERAL CAPITAL (1)	FEDERAL TAX EXPEND	INTEREST EXPENSE	FEDERAL CASH FLOW	BONDS OUT-STANDING (2)	NIF PROJECTS FINANCED (3)	NIF PROJECT R'PMTS (4)	NIF S. FUND P'MTS (5)	NIF CASH BALANCE	NIF PERM. CAPITAL
1986	1,000	38	101	1,137	1,200	182	3	0	2,130	112
1987	1,000	75	211	1,284	2,400	736	29	77	3,721	309
1988	1,000	112	332	1,442	3,600	1,250	98	131	4,841	589
1989	1,000	149	465	1,612	4,800	1,305	198	185	5,977	968
1990	1,000	185	610	1,794	6,000	1,371	304	239	7,123	1,453
1991	1,000	220	770	1,990	7,200	1,445	414	293	8,277	2,051
1992	1,000	257	945	2,202	8,400	1,526	531	347	9,439	2,770
1993	1,000	294	1,138	2,431	9,600	1,613	655	402	10,611	3,618
1994	1,000	330	1,348	2,679	10,800	1,707	785	456	11,793	4,603
1995	1,000	367	1,580	2,947	12,000	1,809	923	510	12,985	5,736
1996	0	404	1,737	2,145	13,200	1,915	1,069	539	13,117	6,923
1997	0	441	1,908	2,349	14,400	2,011	1,224	569	13,203	8,168
1998	0	477	2,097	2,574	15,600	2,082	1,385	599	13,275	9,477
1999	0	514	2,304	2,818	16,800	2,137	1,552	628	13,352	10,855
2060	0	551	2,531	3,082	18,000	2,197	1,724	660	13,438	12,310
2001	0	588	2,781	3,368	19,200	2,263	1,900	689	13,529	13,846
2002	0	624	3,054	3,678	20,400	2,334	2,082	719	13,627	15,471
2003	0	661	3,354	4,015	21,600	2,410	2,269	748	13,733	17,190
2004	0	698	3,882	4,380	22,800	2,492	2,463	778	13,848	19,013
2005	0	734	4,043	4,778	24,000	2,580	2,663	807	13,972	20,948
2006	(2,000)	734	5,330	4,073	24,000	2,689	2,868	783	13,132	21,831
2007	(2,000)	734	5,662	4,397	24,000	2,834	3,059	758	12,279	22,658
2008	(2,000)	734	6,017	4,752	24,000	2,985	3,219	733	11,372	23,424
2009	(2,000)	734	6,407	5,142	24,000	3,094	3,359	709	10,429	24,125
2010	(2,000)	734	6,835	5,569	24,000	3,179	3,502	684	9,477	24,756
2011	(2,000)	734	7,304	6,038	24,000	3,254	3,646	660	8,526	25,313
2012	(2,000)	734	7,818	6,552	24,000	3,330	3,790	635	7,576	25,792
2013	(2,000)	734	8,382	7,117	24,000	3,406	3,933	610	6,625	26,187
2014	(2,000)	734	9,002	7,736	24,000	3,482	4,076	586	5,673	26,492
2015	(2,000)	734	9,680	8,415	24,000	3,558	4,217	561	4,719	26,701
TOTALS:	(10,000)	15,055	107,438	112,493	---	67,177	57,940	16,097	---	---
NPV :	4,750	3,319	---	---	---	16,775	10,008	3,884	---	---

SOURCE: Congressional Budget Office

ASSUMPTIONS: (1) Federal capital of $1 billion a year for 10 years is repaid after 20 years with 5 percent interest;
(2) State or local bonds are issued until the debt service coverage ratio reaches 1.5;
(3) Project spendout is over three years at the rate of typical municipal projects (15,45,40);
(4) Project loans are for 20 years at 5 percent interest;
(5) The annuity sinking fund payments from 1987 are invested in municipal securities;

NOTE: The table shows the flows of government costs and NIF project financing activity over the 30 years during which federal capital is provided and repaid. The net present value (NPV) line shows these flows as the equivalent of 1986 amounts so that future costs and activity levels can be considered in decisions made today. The total federal cash flow is the sum of direct capital outlays and indirect costs including any tax expenditures for municipal matching bonds, and interest on debt issued to finance both outlays and tax expenditures, assuming federal budget deficits continue. Over the 30 years, interest paid to the sinking fund totals $16.7 billion.

TABLE A-7. INFRASTRUCTURE FUND MODEL TAXABLE BOND FUND (In Millions of Dollars)

YEAR	TOTAL FEDERAL CAPITAL (1)	FEDERAL TAX EXPEND	INTEREST EXPENSE (2)	FEDERAL CASH FLOW	STATE LOCAL SHARE (3)	BONDS OUT-STANDING (4)	NIF PROJECTS FINANCED (5)	NIF PROJECT R'PMTS (6)	NIF S.FUND P'MTS (7)	NIF CASH BALANCE	NIF PERM. CAPITAL	PERFORMANCE INDICATORS DEBT COVERAGE (8)	LOANS/ RESERVE (9)
1986	5,000	0	518	5,518	5,000	9,000	1,346	28	0	13,479	5,818	1.9	0.1
1987	0	0	548	548	0	9,000	4,149	223	166	9,895	6,507	1.5	0.5
1988	0	0	603	603	0	11,000	4,324	616	166	8,180	7,153	1.5	1.0
1989	0	0	663	663	0	13,000	1,907	964	202	9,004	7,879	1.5	1.1
1990	0	0	728	728	0	13,000	2,413	1,155	239	7,367	8,647	1.5	1.3
1991	0	0	801	801	0	15,000	1,880	1,368	239	8,346	9,453	1.5	1.5
1992	0	0	880	880	0	15,000	1,750	1,541	276	7,530	10,334	1.5	1.6
1993	0	0	968	968	0	17,000	2,006	1,711	276	8,513	11,235	1.5	1.7
1994	0	0	1,064	1,064	0	18,000	2,021	1,899	313	8,539	12,190	1.5	1.9
1995	0	0	1,170	1,170	0	20,000	2,560	2,101	331	9,063	13,160	1.5	2.1
1996	0	0	1,286	1,286	0	21,000	2,323	2,340	368	8,700	14,191	1.5	2.2
1997	0	0	1,414	1,414	0	22,000	2,544	2,577	386	8,413	15,290	1.5	2.4
1998	0	0	1,554	1,554	0	23,000	2,246	2,808	405	8,542	16,477	1.5	2.5
1999	0	0	1,708	1,708	0	25,000	2,487	3,024	423	9,511	17,721	1.5	2.6
2000	0	0	1,878	1,878	0	27,000	3,016	3,269	460	10,046	19,047	1.5	2.8
2001	0	0	2,065	2,065	0	29,000	3,499	3,563	497	10,176	20,432	1.5	3.0
2002	0	0	2,270	2,270	0	31,000	3,602	3,893	533	10,311	21,897	1.5	3.2
2003	0	0	2,495	2,495	0	31,000	3,424	4,226	570	8,794	23,506	1.5	3.3
2004	0	0	2,743	2,743	0	31,000	2,703	4,530	570	8,239	25,300	1.6	3.4
2005	0	0	3,016	3,016	0	40,000	3,392	4,798	570	16,009	27,060	1.5	3.5
2006	0	0	3,315	3,315	0	38,000	7,238	5,178	570	18,784	28,749	1.7	3.9
2007	0	0	3,645	3,645	0	42,000	9,845	5,723	699	15,796	30,378	1.6	4.6
2008	0	0	4,007	4,007	0	46,000	8,438	6,219	736	16,294	32,071	1.5	5.2
2009	0	0	4,405	4,405	0	46,000	7,577	6,641	809	13,782	33,903	1.6	5.6
2010	0	0	4,843	4,843	0	56,000	7,808	7,165	846	18,962	35,669	1.5	6.1
2011	0	0	5,324	5,324	0	56,000	8,606	7,702	993	15,471	37,525	1.5	6.6
2012	0	0	5,853	5,853	0	58,000	8,284	8,327	1,030	12,447	39,505	1.5	7.1
2013	0	0	6,434	6,434	0	58,000	5,383	8,866	1,030	12,824	41,756	1.5	7.3
2014	0	0	7,074	7,074	0	69,000	7,046	9,219	1,049	21,515	43,918	1.5	7.6
2015	0	0	7,776	7,776	0	67,000	9,839	9,744	1,233	15,529	46,180	1.5	8.1
TOTALS	5,000	0	81,046	86,046	5,000	---	133,859	121,419	15,986	---	---	---	---
NPV	5,000	0	---	---	5,000	---	32,511	22,315	3,381	---	---	---	---

SOURCE: Congressional Budget Office.

ASSUMPTIONS:
(1) Federal appropriation of $5 billion paid immediately to NIF for reserve capital;
(2) Interest expense for debt service on federal outlay at Treasury refinancing rate (9.7 percent);
(3) States match federal capital for NIF reserve;
(4) NIF issues 20-year taxable bonds at Treasury rate, subject to debt-service coverage and loans/reserve limits;
(5) Project spendout is over three years at a rate typical of municipal projects (15,45,40);
(6) Project loans are for 20 years at 7 percent interest;
(7) The annuity sinking fund payments from 1987 are invested in Treasury securities;
(8) Debt-service coverage held to a minimum of 1.5; this may be high for a federally guaranteed NIF but operating costs for NIF if included would reduce effective coverage;
(9) Total project loans outstanding are limited to a maximum of 10 times the face value of reserve capital. This maximum is not a practical limit on lending.

NOTE: The table shows the flows of government costs and NIF project financing activity over its first 30 years. The net present value (NPV) line shows these flows as the equivalent of 1986 amounts so that future costs and activity levels can be considered in decisions made today. The total federal cash flow is the sum of direct capital outlays and indirect costs including any tax expenditures for municipal matching bonds, and interest on debt issued to finance both outlays and tax expenditures, assuming federal budget deficits continue. Over the 30 years, interest paid to the sinking fund totals $20.4 billion.

TABLE A-8. INFRASTRUCTURE FUND MODEL ZERO COUPON BOND OPTION (In Millions of Dollars)

YEAR	SINKING FUND					BOND ACCOUNT			FEDERAL OUTLAYS					STATE/ LOCAL COSTS	PROJECTS FINANCED		
	OPENING BALANCE	DEPOSITS	INTEREST EARNED	PAYOUT	CLOSING BALANCE	BONDS ISSUED	BONDS REPAID	TAX EXPENDITURES	BONDS REPAID	DIRECT GRANTS	TAX EXPENDITURES	SUBTOTAL	INTEREST EXPENSE		FROM BONDS	FROM MATCHING GRANTS	TOTAL
		(1)	(2)			(3)		(4)		(5)	(6)	(6)		(7)	(8)	(9)	
1986	0	1,000	97	0	1,097	1,834	0	28	0	80	28	108	(5)	20	1,834	100	1,934
1987	1,097	1,000	203	0	2,300	1,834	0	93	0	270	93	363	(18)	68	1,834	338	2,174
1988	2,300	1,000	320	0	3,621	1,834	0	171	0	510	171	681	(35)	120	1,834	630	2,474
1989	3,621	1,000	448	0	5,069	1,834	0	263	0	690	263	953	(47)	173	1,834	863	2,699
1990	5,069	1,000	589	0	6,657	1,834	0	373	0	900	373	1,273	(61)	225	1,834	1,125	2,961
1991	6,657	0	646	0	7,303	0	0	457	0	870	457	1,327	(56)	218	0	1,088	1,088
1992	7,303	0	708	0	8,012	0	0	563	0	730	563	1,293	(44)	183	0	913	913
1993	8,012	0	777	0	8,789	0	0	555	0	490	555	1,045	(20)	123	0	613	613
1994	8,789	0	853	0	9,641	0	0	611	0	310	611	921	2	78	0	388	388
1995	9,641	0	935	0	10,576	0	0	673	0	100	673	773	28	25	0	125	125
1996	10,576	0	1,026	0	11,602	0	0	742	0	50	742	792	42	13	0	63	63
1997	11,602	0	1,125	0	12,728	0	0	818	0	0	818	818	59	0	0	0	0
1998	12,728	0	1,235	0	13,962	0	0	901	0	0	901	901	72	0	0	0	0
1999	13,962	0	1,354	0	15,317	0	0	993	0	0	993	993	88	0	0	0	0
2000	15,317	0	1,486	0	16,802	0	0	1,094	0	0	1,094	1,094	107	0	0	0	0
2001	16,802	0	1,630	0	18,432	0	0	1,206	0	0	1,206	1,206	128	0	0	0	0
2002	18,432	0	1,788	0	20,220	0	0	1,329	0	0	1,329	1,329	152	0	0	0	0
2003	20,220	0	1,961	0	22,182	0	0	1,465	0	0	1,465	1,465	180	0	0	0	0
2004	22,182	0	2,152	0	24,333	0	0	1,614	0	0	1,614	1,614	212	0	0	0	0
2005	24,333	0	2,360	0	26,693	0	0	1,779	0	0	1,779	1,779	249	0	0	0	0
2006	26,693	0	2,589	0	29,283	0	0	1,960	0	0	1,960	1,960	290	0	0	0	0
2007	29,283	0	2,840	0	32,123	0	0	2,160	0	0	2,160	2,160	338	0	0	0	0
2008	32,123	0	3,116	0	35,239	0	0	2,380	0	0	2,380	2,380	392	0	0	0	0
2009	35,239	0	3,418	0	38,657	0	0	2,623	0	0	2,623	2,623	454	0	0	0	0
2010	38,657	0	3,750	0	42,407	0	0	2,891	0	0	2,891	2,891	524	0	0	0	0
2011	42,407	0	4,113	0	46,521	0	0	3,185	0	0	3,185	3,185	603	0	0	0	0
2012	46,521	0	4,512	0	51,033	0	0	3,510	0	0	3,510	3,510	693	0	0	0	0
2013	51,033	0	4,950	0	55,983	0	0	3,868	0	0	3,868	3,868	795	0	0	0	0
2014	55,983	0	5,430	0	61,414	0	0	4,263	0	0	4,263	4,263	910	0	0	0	0
2015	61,414	0	5,957	0	67,371	0	0	4,698	0	0	4,698	4,698	1,041	0	0	0	0
2016	67,371	0	6,536	16,077	56,269	0	16,077	4,639	16,077	0	4,639	20,716	2,698	0	0	0	0
2017	56,269	0	5,899	16,077	46,091	0	16,077	3,994	16,077	0	3,994	20,070	2,895	0	0	0	0
2018	46,091	0	5,717	16,077	35,732	0	16,077	3,144	16,077	0	3,144	19,220	3,093	0	0	0	0
2019	35,732	0	1,422	16,077	16,077	0	16,077	2,079	16,077	0	2,079	18,155	3,290	0	0	0	0
2020	16,077	0	0	16,077	0	0	16,077	764	16,077	0	764	16,840	3,481	0	0	0	0
TOTALS:	---	5,000	75,384	80,384	---	9,182	80,384	61,843	80,384	5,000	61,843	147,229	22,536	1,250	9,182	6,250	15,432
NPV(9):	---	4,349	---	7,987	---	7,987	7,987	---	7,987	3,634	---	11,613	---	987	7,987	4,533	12,520

SOURCE: Congressional Budget Office.

ASSUMPTIONS: (1) Half of a federal appropriation of $2 billion a year for five years is paid into a federal sinking fund held by Treasury, and half appropriated as 80 percent matching grants;
(2) Sinking fund earns Treasury refinancing rate (9.7 percent);
(3) The sinking fund repays tax-exempt zero coupon bonds issued by local authorities for capital projects;
(4) Federal tax expenditures are estimated revenue losses at the marginal rate for bond buyers;
(5) Project spendout at typical rates for transit projects (8,19,26,18,21,5,3);
(6) Interest expense for debt service on federal outlays and tax expenditures at Treasury refinancing rate (9.7 percent);
(7) Matching grants, 80 percent federal, 20 percent local;
(8) No local match required;
(9) NPVs for outlays and project financed at the tax-exempt rate (7.5 percent). This shows cash effects on federal finance.

NOTE: The table shows government costs and project financing activity (in millions of dollars) over the 35 years from the first issue to the last repayment of local authority bonds. The net present value (NPV) line shows these flows as the equivalent of 1986 amounts so that future costs and activity levels can be considered in decision-made today. In this case the federal cost to the outlay after 30 years to repay the zero coupon bonds from amounts accumulated in the Treasury sinking fund, and direct grants. The NPV is correctly calculated at the tax-exempt or after tax rate without taking account of the tax expenditures. Equivalent treatment in other cases would credit taxes generated by taxable bond issues, and use after tax federal rates for discounting. Over the 35 years interest paid to the sinking fund totals $73 billion.